

SG382/D

Motorola RF CATV Distribution Amplifiers

Since the very inception of the cable TV distribution industry, Motorola has excelled as a leading supplier of innovative technical products to the CATV market. Three examples of such solutions are the first 860 MHz conventional and power doubling hybrids, patented Darlington circuitry, and the only ultra–linear feedforward amplifiers in the industry.

Highlighted in the Selector Guide is the first series of low current reverse amplifiers, featuring new packaging as well as the newly introduced fiber optic receiver. Also premiered herein are exciting soon–to–be released state–of–the–art products utilizing transistors with sub–micron geometries.

Fiber Optic Receivers for HFC

40–860 MHz Hybrids

Device	Hybrid Responsivity Min dB	Flatness dB	Maximum Distortion Specifications IMD 2(52) dB	IMD 3(52) dB	Equivalent Input Noise pA/$\sqrt{Hz}$ Max	Package/ Style
MHLW8000 (53) ★	23.0	1.0	–70	–80	7.5	714U/1

Note: Please call your local Motorola Sales Office for information on optical connector options for this part.

Forward Amplifiers

40–1000 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications				Noise Figure @ 860 MHz dB Max	Package/ Style
			Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 152 CH	Cross Modulation dB 152 CH		
MHW9142 (54)	14	152	+38	–59(40)	–59	–63	8.5	714/1
MHW9182 (54)	18	152	+38	–59(40)	–59	–59	8.0	714/1
MHW9242 (55) ★	24	152	+38	–59(40)	–58	–59	8	714/1

(40)Composite 2nd Order; V_{out} = +38 dBmV/ch

(52)Two laser test with 0.5 mW optical power at 40% modulation index per laser; f1 = 373.25 MHz f2 = 415.25 MHz

(53)Refer to Figure 3 for circuit configuration information.

(54)Refer to Figure 2 for circuit configuration information.

(55)Refer to Figure 4 for circuit configuration information.

★New Product



CATV Distribution: Forward Amplifiers (continued)

40–860 MHz Hybrids

Device	Gain dB Typ	Frequency MHz	V_{CC} Volts	2nd Order IMD @ V_{out} = 50 dBmV/ch Max	DIN45004B @ f=860 MHz dBμV Min	Noise Figure @ 860 MHz dB Max	Package/ Style
CA901 (56)	17	40 – 860	24	–60	120	8	714P/2
CA901A (56)	17	40 – 860	24	–64	120	8	714P/2
Power Doubling Hybrids							
CA922 (56)	17	40 – 860	24	–63	123	9.5	714P/2
CA922A (56)	17	40 – 860	24	–67	123	9.5	714P/2
Hybrid Jumper							
CATHRU	0	1 – 1000	75 Ohm Broadband Hybrid Jumper				714V

40–860 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.)	Channel Loading Capacity	Maximum Distortion Specifications				Noise Figure @ 860 MHz	Package/ Style
			Output Level	2nd Order Test	Composite Triple Beat dB	Cross Modulation FM = 55.25 MHz dB	dB	
	dB		dBmV	dB	128 CH	128 CH	Max	
MHW8142 (54)	14	128	+38	–60(40)	– 61	– 66	8.0	714/1
MHW8182 (54)	18	128	+38	–60(40)	– 60	– 60	7	714/1
MHW8222 (54)	22	128	+38	–60(40)	– 60	– 60	7.5	714/1
MHW8242 (55)★	24	128	+38	–60(40)	– 60	– 60	7.5	714/1
MHW8272 (55)★	27	128	+38	–60(40)	– 60	– 60	7.0	714/1
MHW8292 (55)★	29	128	+38	–56(40)	– 60	– 60	7.0	714/1
Power Doubling Hybrids								
MHW8185 (46,54)	18.5	128	+40	–62(39)	– 64	– 64	8.0	714Y/1
MHW8205 (46,54)	20	128	+40	–60(39)	– 63	– 64	8.0	714Y/1
Feedforward Hybrids								
MFF524B★	24	128	+44	–68(36)	– 66	—	13.0	825A/2

40–750 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.)	Channel Loading Capacity	Maximum Distortion Specifications				Noise Figure @ 750 MHz	Package/ Style
			Output Level	2nd Order Test	Composite Triple Beat dB	Cross Modulation FM = 55.25 MHz dB	dB	
	dB		dBmV	dB	110 CH	110 CH	Max	
MHW7142 (54)	14	110	+40	–60(39)	– 62	– 66	8.0	714/1
MHW7182 (54)	18	110	+40	–62(39)	– 62	– 64	6.5	714/1
MHW7222 (54)	22	110	+40	–55(39)	– 60	– 60	7	714/1
MHW7242 (55)★	24	110	+40	–60(39)	– 60	– 60	7	714/1
MHW7272 (55)★	27	110	+40	–60(39)	– 60	– 60	6.5	714/1
MHW7292 (55)★	29	110	+40	–60(39)	– 60	– 60	6.5	714/1

(36)Composite 2nd order; V_{out} = +44 dBmV/ch
(39)Composite 2nd order; V_{out} = +40 dBmV/ch
(40)Composite 2nd Order; V_{out} = +38 dBmV/ch
(46)To be introduced 1Q97.
(54)Refer to Figure 2 for circuit configuration information.
(55)Refer to Figure 4 for circuit configuration information.
(56)Refer to Figure 5 for circuit configuration information.
★New Product

40 – 750 MHz Hybrids, V_{CC} = 24 Vdc, Class A (continued)

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 110 CH	Cross Modulation FM = 55.25 MHz dB 110 CH	Noise Figure @ 750 MHz dB Max	Package/ Style
Power Doubling Hybrids								
MHW7185A [54]	18.5	110	+44	–58[36]	–58	–65	8.5	714/1
MHW7185C[46,54]	18.8	110	+44	–64	–62	–63	7.0	714Y/1
MHW7205A [54]	20	110	+44	–56[36]	–57	–64	8.0	714/1
MHW7205C[46,54]	20	110	+44	–63	–61	–62	7.0	714Y/1
Feedforward Hybrids								
MFF424B	24	110	+44	–70[36]	–68	—	13	825A/2

40 – 600 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 87 CH	Cross Modulation dB 87 CH	Noise Figure @ 600 MHz dB Max	Package/ Style
MHW6182–6 [54]	18	87	+44	–56[36]	–57	–55	6	714/1
MHW6222–6 [54]	22	87	+44	–56[36]	–56	–56	6	714/1
MHW6272–6 [46,55]	27	87	+44	–63[36]	–57	–55	6.5	714/1
MHW6292–6 [46,55]	29	87	+44	–63[36]	–57	–55	6.5	714/1
Power Doubling Hybrids								
MHW6185–6A [54]	18	87	+44	–64[36]	–64	–66	7	714/1
MHW6205–6A [54]	20	87	+44	–63[36]	–63	–65	6.5	714/1
Feedforward Hybrids								
MFF324B	24	85	+44	–86[38]	–73	–68	12.5	825A/2

40 – 550 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 77 CH	Cross Modulation dB 77 CH	Noise Figure @ 550 MHz dB Max	Package/ Style
MHW6142 [57]	14	77	+44	–72[35]	–59	–62	7.5	714/1
MHW6172 [57]	17	77	+44	–72[35]	–59	–62	7	714/1
MHW6182 [57]	18	77	+44	–72[35]	–58	–62	7	714/1
MHW6222 [57]	22	77	+44	–66[35]	–57	–57	6	714/1
MHW6272 [57]	27	77	+44	–64[35]	–57	–57	6.5	714/1
MHW6342 [57]	34	77	+44	–64[35]	–57	–57	6.5	714/1
Power Doubling Hybrids								
MHW6185B [57]	18	77	+44	–65[36]	–65	–68	7.5	714/1
MHW6205 [57]	20	77	+44	–60[36]	–64	–67	7.5	714/1
MHW6225 [57]	22	77	+44	–55[36]	–62	–60	7.0	714/1

(35) Channels 2 and M30 @ M39
(36) Composite 2nd order; V_{out} = + 44 dBmV/ch
(38) Channels 2 and M39 @ M48
(46) To be introduced 1Q97.
(54) Refer to Figure 2 for circuit configuration information.
(55) Refer to Figure 4 for circuit configuration information.
(57) Refer to Figure 1 for circuit configuration information.

CATV Distribution: Forward Amplifiers (continued)

40–550 MHz Hybrids, V_{CC} = 24 Vdc, Class A (continued)

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 77 CH	Cross Modulation dB 77 CH	Noise Figure @ 550 MHz dB Max	Package/ Style
Feedforward Hybrids								
MFF224B	24	77	+44	–86[35]	–75	–70	11	825A/2

40–450 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test dB	Composite Triple Beat dB 60 CH	Cross Modulation dB 60 CH	Noise Figure @ 450 MHz dB Max	Package/ Style
MHW5142A [57]	14	60	+46	–74[31]	–61	–62	7	714/1
MHW5172A [57]	17	60	+46	–74[31]	–60	–62	7	714/1
MHW5182A [57]	18	60	+46	–72[31]	–61	–59	6.5	714/1
MHW5222A [57]	22	60	+46	–72[31]	–60	–59	5.5	714/1
MHW5272A [57]	27	60	+46	–68[31]	–59	–60	6.0	714/1
MHW5342A [57]	34	60	+46	–68[31]	–59	–59	6.0	714/1
MHW5382A [57]	38	60	+46	–64[31]	–59	–59	5.0	714/1
Power Doubling Hybrids								
MHW5185B [57]	18	60	+46	–67[32]	–67	–67	7.0	714/1
MHW5225 [57]	22	60	+46	–69[31]	–62	–62	6.0	714/1
Feedforward Hybrids								
MFF124B	24	60	+46	–84[31]	–79	–75	10	825A/2

Reverse Amplifiers

5–200 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	Maximum Distortion Specifications: Output Level dBmV	2nd Order Test[30] dB	Composite Triple Beat dB 22 CH	Composite Triple Beat dB 26 CH	Cross Modulation dB 22 CH	Cross Modulation dB 26 CH	Noise Figure @ 175 MHz dB Max	Package/ Style
MHW1134 [57]	13	22	+50	–72	–73	–71[19]	–65	–65[19]	7	714/1
MHW1184 [57]	18	22	+50	–72	–70	–70[19]	–64	–64[19]	5.5	714/1
MHW1224 [57]	22	22	+50	–72	–69	–68.5[19]	–62	–62[19]	5.5	714/1
MHW1244 [57]	24	22	+50	–72	–68	–67.5[19]	–61	–61[19]	5	714/1

[19] Typical
[30] Channels 2 and A @ 7
[31] Channels 2 and M13 @ M22
[32] Composite 2nd order; V_{out} = +46 dBmV/ch
[35] Channels 2 and M30 @ M39
[57] Refer to Figure 1 for circuit configuration information.

Low Current Amplifiers — 5–50 MHz Hybrids, V_{CC} = 24 Vdc, Class A

Device	Hybrid Gain (Nom.) dB	Channel Loading Capacity	I_{DC} mA Max	Maximum Distortion Specifications				Noise Figure @ 50 MHz dB Max	Package/ Style
				Output Level dBmV	2nd Order Test(30) dB	Composite Triple Beat dB 4 CH	Cross Modulation dB 4 CH		
MHW1184L (57)	18	4	135	+50	–70	–73	–64	5	714/1
MHW1224L (57)	22	4	135	+50	–70	–72	–63	5	714/1
MHW1254L (57)	25	4	135	+50	–70	–70	–62	4.5	714/1
MHW1304L (57)	30	4	135	+50	–70	–66	–57	4.5	714/1

(19)Typical
(30)Channels 2 and A @ 7
(57)Refer to Figure 1 for circuit configuration information.
★New Product

Philips to Motorola Cross Reference

Philips	Motorola
—	MHW1184L
—	MHW1224L
—	MHW1254L
—	MHW1304L
BGY61	MHW1134
BGY65	MHW1184
BGY67	MHW1224
BGY67A	MHW1244
BGY83	MHW5142A
BGY85	MHW5172A
BGY85A	MHW5182A
BGY87	MHW5222A
BGY87B	MHW5272A
BGY88	MHW5342A
BGY89	MHW5382A
BGD102	MHW5185B
BGD104	MHW5205
BGD106	MHW5225
None	MFF124B
BGY583	MHW6142
BGY585	MHW6172

Philips	Motorola
BGY585A	MHW6182
BGY587	MHW6222
BGY587B	MHW6272
BGY588	MHW6342
BGD502	MHW6185B
BGD504	MHW6205
BGD506	MHW6225
None	MFF224B
BGY685A	MHW6182–6A
BGY687	MHW6222–6A
BGY687B	MHW6272–6
—	MHW6292–6
BGD602	MHW6185–6A
—	MHW6205–6A
None	MFF324B
—	MHW7142
BGY785A	MHW7182
BGY787	MHW7222
—	MHW7242
—	MHW7242
BGY787B	MHW7272
—	MHW7292

Philips	Motorola
BGD702	MHW7185A
BGD704	MHW7205A
None	MFF424B
—	MHW8142
BGY885A	MHW8182
—	MHW8222
—	MHW8242
—	MHW8272
BGY887B	MHW8292
BGD802	MHW8185
—	MHW8205
None	MFF524B
BGX885N	CA901
BGX885N	CA901A
BGD885	CA922
BGD885	CA922A
—	MHW9142
BGY1085A	MHW9182
MHW9242	MHW9242

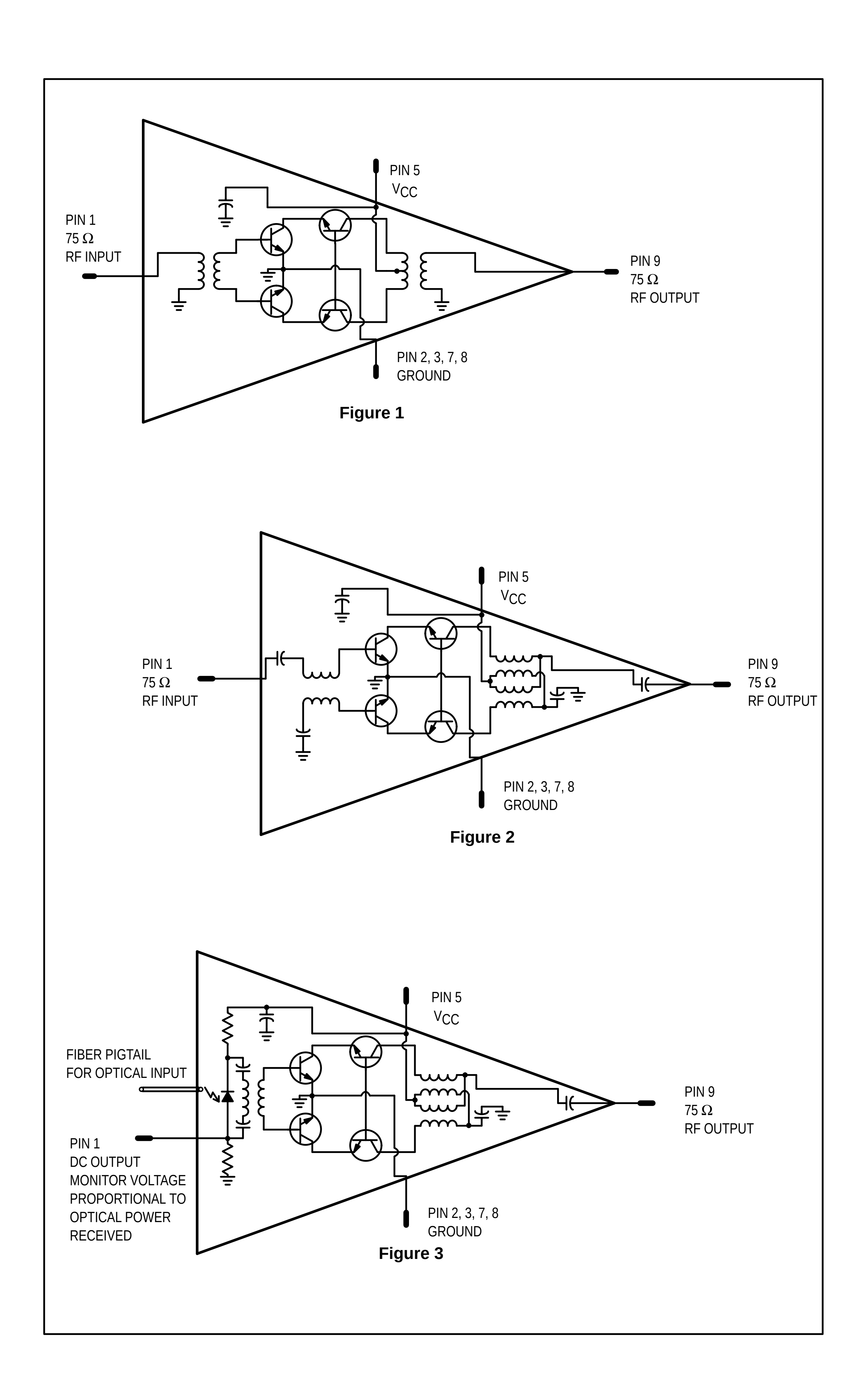


Figure 1

Figure 2

Figure 3

PIN 5
V_{CC}

PIN 1
75 Ω
RF INPUT

PIN 9
75 Ω
RF OUTPUT

PIN 2, 3, 7, 8
GROUND

Figure 4

PIN 8
V_{CC}

PIN 1
75 Ω
RF INPUT

PIN 9
75 Ω
RF OUTPUT

EXTERNAL BIAS
RESISTOR

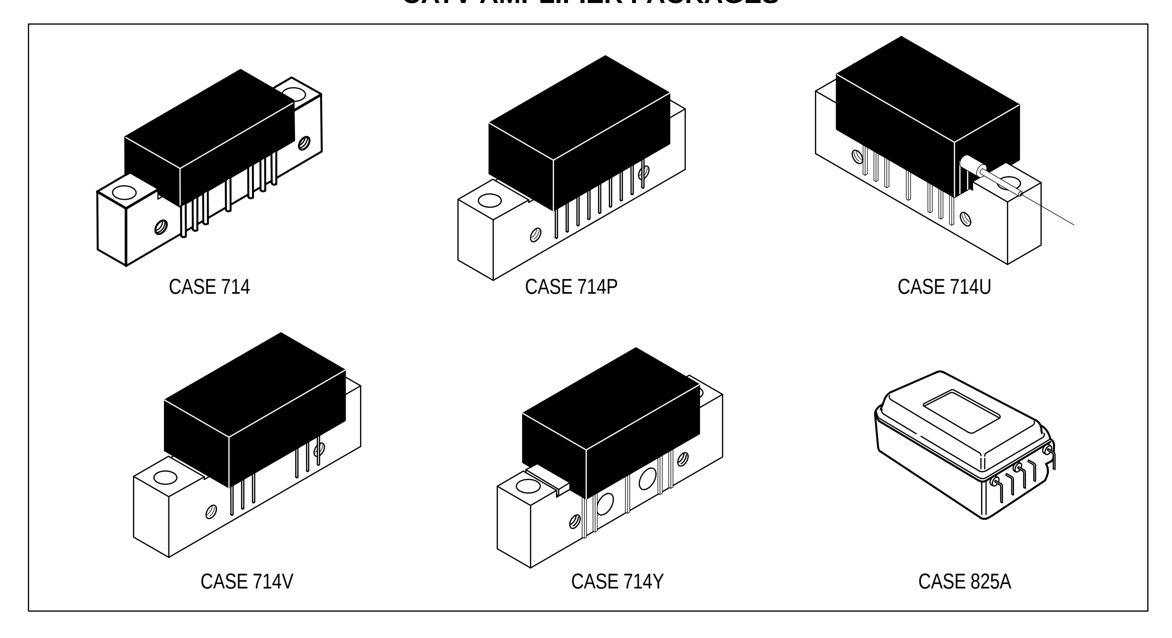
EXTERNAL
DECOUPLING
CAPACITOR

PIN 4
CONNECTION FOR
EXTERNAL BIAS
RESISTOR

PIN 2, 3, 5, 6, 7
GROUND

Figure 5

CATV AMPLIFIER PACKAGES





How to Access CATV and RF Data On–line!

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http://www.mot.com/sps/

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